

**In the Drawings**

Figure, Figure 2, and Figure 3 are replaced with the replacement figures attached hereto. Figure 4 and Figure 5 have been added as requested by the Examiner to reflect information in the claims that forms part of the specification. No new subject matter has been added to the figures. Reformat 17, as previously disclosed in the specification in Paragraph [0029] has been shown in the drawings.

### **Response to 35 U.S.C. § 112 Rejection**

Applicant has provided the appropriate drawings as required by the Examiner. The drawings, which reflect the claims that are part of the specification, add no new matter.

### **Response to 35 U.S.C. § 103 Rejection**

#### **US Patent No. 2,940,921 fails to teach the current invention**

Applicant respectfully submits that claims 1, 3-6, 9, 11, 12, 17, 18, 19, 23, and 24 are not obvious over U.S. Patent No. 2,940,921 (Malloy). Applicant respectfully submits that independent claim 1 contains material elements that are missing in the Malloy patent and that it would not be obvious to add or alter the elements of Malloy to create a more efficient process of the current invention.

As recognized in Malloy, reforming processes (in Malloy's case, fixed bed reforming) for reforming naphthas are faced with three general categories of components which respond differently to the reforming process. Malloy identifies the groups as: (1) C4- group; (2) C5 and C6 hydrocarbons, which are paraffins (Malloy, Col. 1, l. 18); and (3) C7+ group. Malloy suggests that these defined component groups be handled selectively. To that end, Malloy teaches running a full range naphtha feed stock through a first reactor in a series of reactors. [Malloy, Col. 1, l. 55]. After the first reactor, which is run at temperatures below cracking, Malloy fractionates the products and removes the paraffins. Malloy does this because paraffins are difficult to process and are problematic at higher temperatures. Thus, Malloy separates out the paraffins and runs the remaining fractions at higher temperatures.

In contrast, the current invention recognizes the same problem, namely, that different components react in different ways, but the current invention treats each fraction thereby producing a more efficient and superior product slate. In claims 1 and 19, it is shown that the reaction products after reaction in the first stage, shown as a non-traditional CCR Platform reformer, is subjected to separation. It is recognized that the lighter naphthenes will respond most quickly to treatment, by converting to aromatics, while the other components require further processing. (Specification, para [0005]) Claim 1 and 19 separate the treated naphthenes (now aromatics) out of the stream leaving the first reactor before sending the remainder of the stream as feed to the second stage of the reformer. In this manner, the aromatics will not be subjected to further processing that could create an inferior process. Similarly, the aromatics being removed provides a feed volume that is reduced and that allows treatment of the remaining fractions without regard to aromatics. The hard to convert hydrocarbons continue to be processed creating a superior product. Thus, while Malloy and the current invention recognize the same problem, the inventions address the problem in very different manners. While Malloy removes the hard-to-handle component, the paraffins, and continues with the reforming process, the current invention instead removes the aromatics, addresses the paraffins and completes the reaction to produce higher quality product.

As noted by the examiner, the C7+ fractions of Malloy are combined and ultimately arrive at a reformat pool, however this is only after the C7+ is combined with the C4- fraction and has undergone significant treatment (see col. 2 line 61 – col. 3 line 17). In contrast, as discussed above, claim 1 and 19 of the current application claims that the first liquid stream and second liquid stream are combined then cooled and immediately sent to a reformat pool. By removing the liquid, the product sent to the next reactor in the current application will have a lower

concentration of both aromatics and of the naphthenes that were converted to aromatics. This changes the equilibrium of the product entering the reactor and enhances the driving force for the formation of aromatics. In addition, because most, if not all, of the naphthenes have been depleted in the first reactor, the remaining processes can be more specifically tailored to converting the more difficult paraffins.

Therefore, while Malloy and the current application address the same problem, the Malloy patent fails to teach the improved method of the current independent claims 1 and 19. Naphtha reforming produces high octane gasoline and aromatics in the petrochemical industry. The amount of benzene in aromatics as gasoline is carefully controlled in the world. Therefore, improvements in efficiency in this process can translate to substantial economic incentives. The current invention addresses a long felt need to create a higher quality product efficiently.

The Federal Circuit noted in *In re Fritch* that:

Under Section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so. Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. (emphasis original) 23 U.S.P.Q. 2d 1780, 1784 (Fed. Cir. 1992).

Malloy does not suggest any motivation or desire to modify the elements to accomplish Applicant's present invention. On the contrary, Malloy teaches away from the current invention by separating the paraffins to avoid processing them. The invention as claimed in independent claims 1 and 19 and the claims that depend therefrom are thus nonobvious.

Applicant respectfully submits that claims are distinguishable from Malloy in view of Rambo. The elements missing from Malloy are not supplied by Rambo. Furthermore, Applicant would

note that Rambo is non-analogous art in that it is a gas separation plant. Rambo teaches the separation of light hydrocarbons, while the current invention is directed toward naphtha reforming. The art of separation through the use of a demethanizer or a deethanizer is disparate from the art of reforming straight chain alkanes into reformed molecules. One of ordinary skill in the art would not look to the field of gas separation when addressing a need in naphtha reforming. As such, there is no motivation or suggestion to combine the art.

Applicant respectfully submits that claims 10, 14, 21 and 22 are not obvious over Malloy in view of U.S. Patent No. 4,401,554 (Choi). As noted above, Malloy is missing elements of the current invention in the independent claims, which also form limitations of these dependent claims. Choi does not provide the missing limitations. Choi discloses that a hydrogen stream used in the processing of the naphtha is split with a portion fed to the first reactor and the other portion fed to the third for the purpose of reducing the average partial pressure. In the present application, it is the hydrocarbon feed that is being split for the purpose of increasing the amount of feed being delivered to the second or third reactor, as appropriate. One of ordinary skill in the art would not look to the steps taken with the stream of hydrogen when addressing the need to control hydrocarbon feed to successive reactors in a reforming process. As such, there is no motivation or suggestion to combine the art.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, Applicant reserves

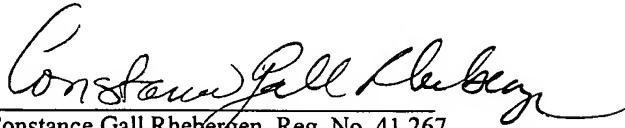
The foregoing remarks are intended to assist the Examiner in re-examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention, which render it patentable, being only examples of certain advantageous features and differences that Applicant's attorney chooses to mention at this time.

Reconsideration of the application and allowance of all of the claims are respectfully requested. In view of the foregoing Response, Applicant respectfully submits that all of the claims are allowable, and Applicant respectfully requests the issuance of a Notice of Allowance. Should further discussion regarding the application be desired by the Examiner, a telephone conference is respectfully requested. I can be reached at (713) 221-3306.

In the event the fee is deemed insufficient, the Commissioner is authorized to charge  
BRACEWELL & GIULIANI LLP, Deposit Account 50-0259 (4159.3005) in the amount of any  
deficiency.

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Respectfully submitted,



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